

GENERAL PURPOSE COMB GENERATOR

1 Introduction

The TBCG4 is a general purpose harmonic comb generator with a switchable base frequency of 20 MHz, 10 MHz or 5 MHz. It generates a flat comb spectrum up to 1 GHz. The comb generator is powered via a USB C socket on the rear panel.

The TBCG4 is designed and characterized to serve as a versatile lab tool for measuring cable resonances, shielding effectiveness, filters, crosstalk, EMC test setups and more. Comb generators are commonly utilized as a general purpose source for wideband RF signals or narrow pulses with a fast rise time.



2 Specification

Base frequencies: 5 MHz, 10 MHz, 25 MHz, selected via slide-switch on front panel

Characterized comb spectrum: 5 MHz - 1 GHz

Avg. output amplitude of 20 MHz comb spectrum: - 19 dBm +/- 3 dB (above 6th harmonic)

Avg. output amplitude of 10 MHz comb spectrum: - 28 dBm +/- 3 dB (above 6th harmonic)

Avg. output amplitude of 5 MHz comb spectrum: - 38 dBm +/- 3 dB (above 6th harmonic)

Spectrum flatness from 5 MHz to 1 GHz: < 10 dB (for spectral lines above the 6th harmonic)

Pulse rise time: < 180 ps

Output: 50 Ohm, SMA female

Power supply: USB C

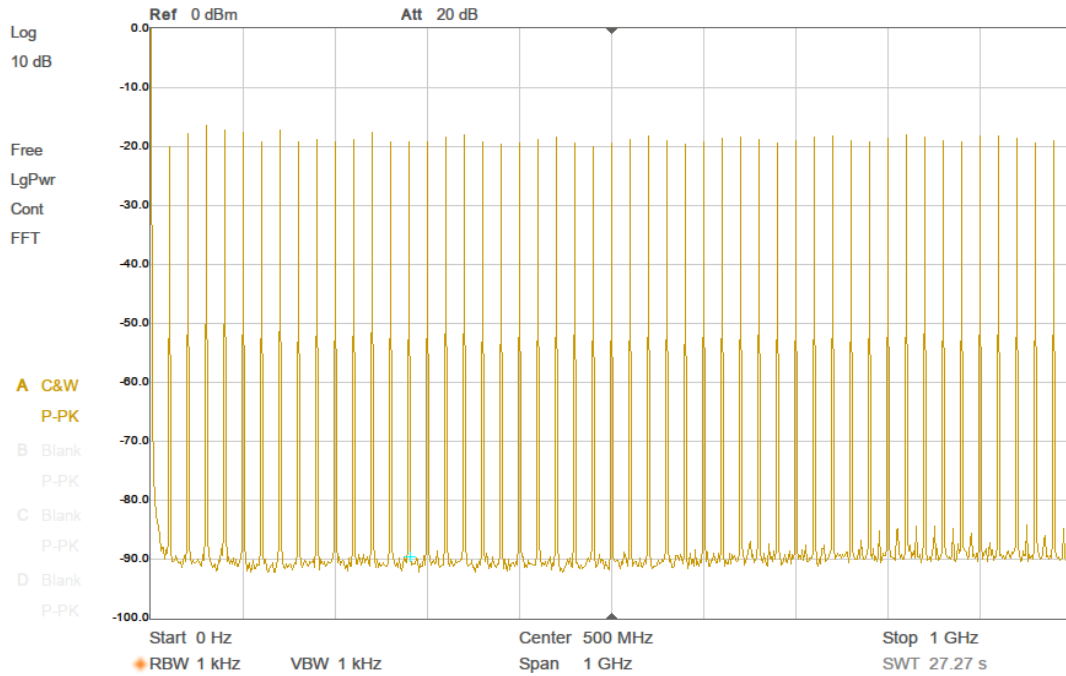
Current consumption: 120 mA

Dimensions, L x W x H: 56 mm x 81mm x 33 mm

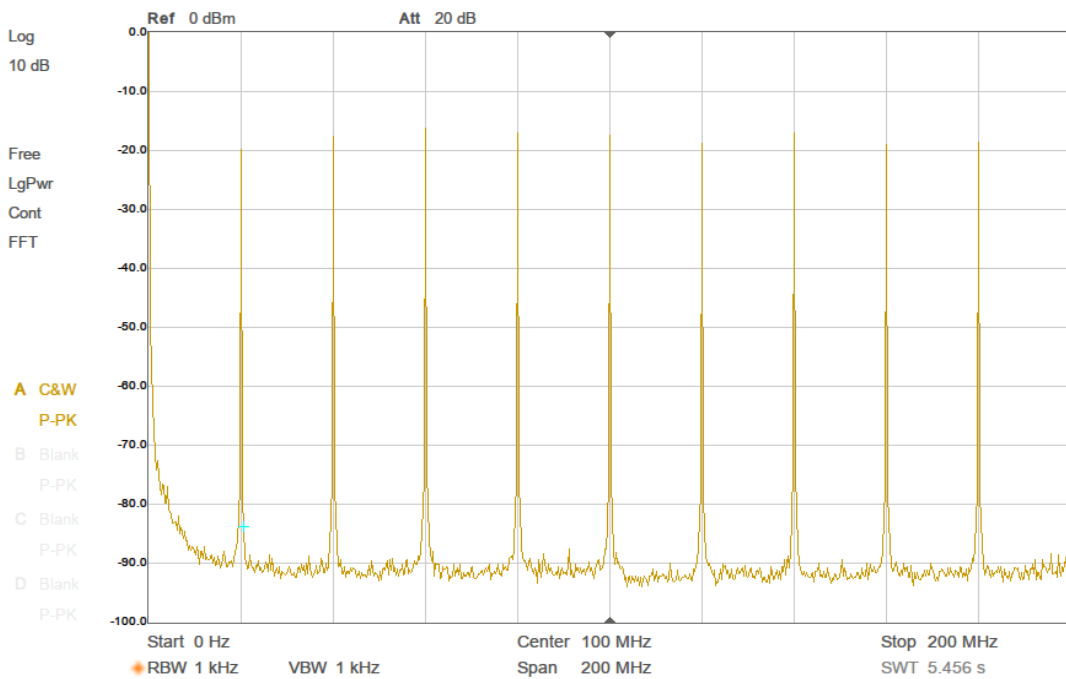
Weight: 95g

GENERAL PURPOSE COMB GENERATOR

3 Measurement plots

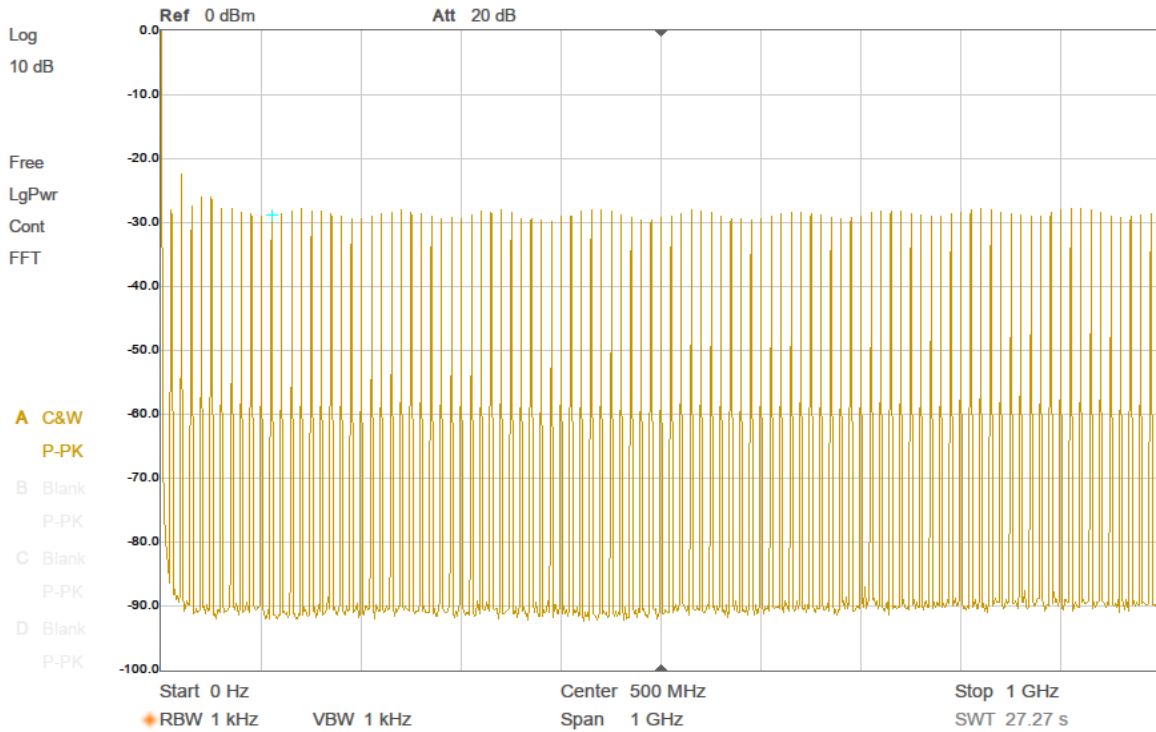


Picture 1: typ. comb spectrum, 0 – 1 GHz, 20 MHz base frequency

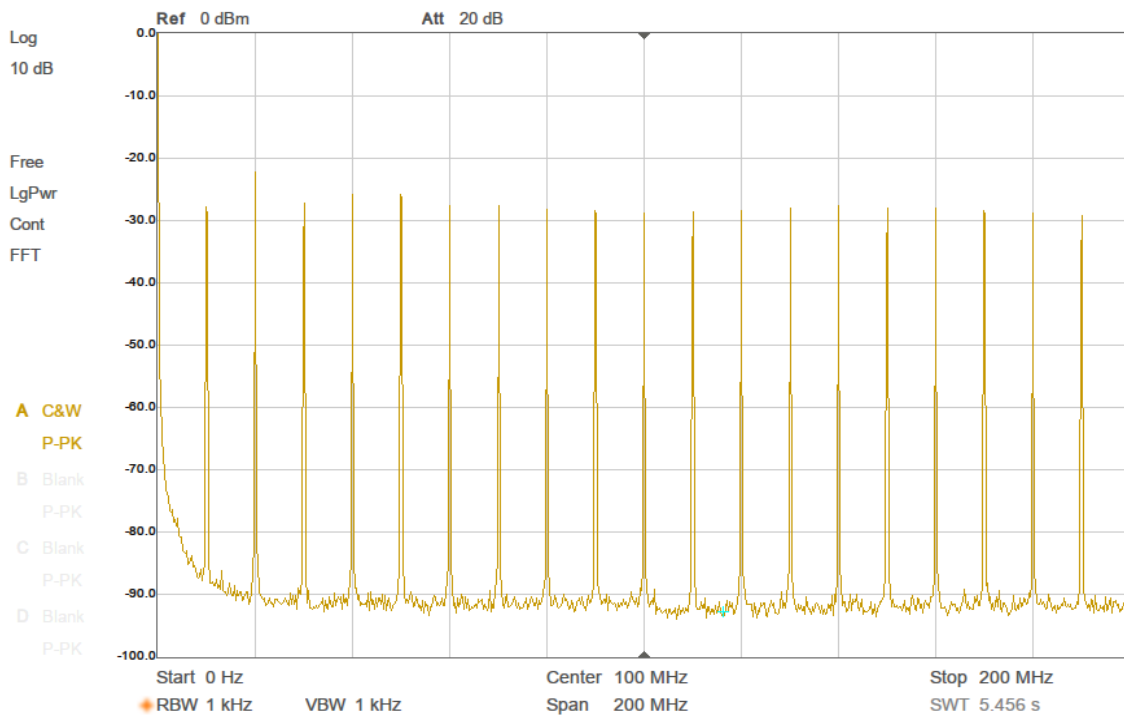


Picture 2: typ. comb spectrum, 0 – 200 MHz, 20 MHz base frequency

GENERAL PURPOSE COMB GENERATOR

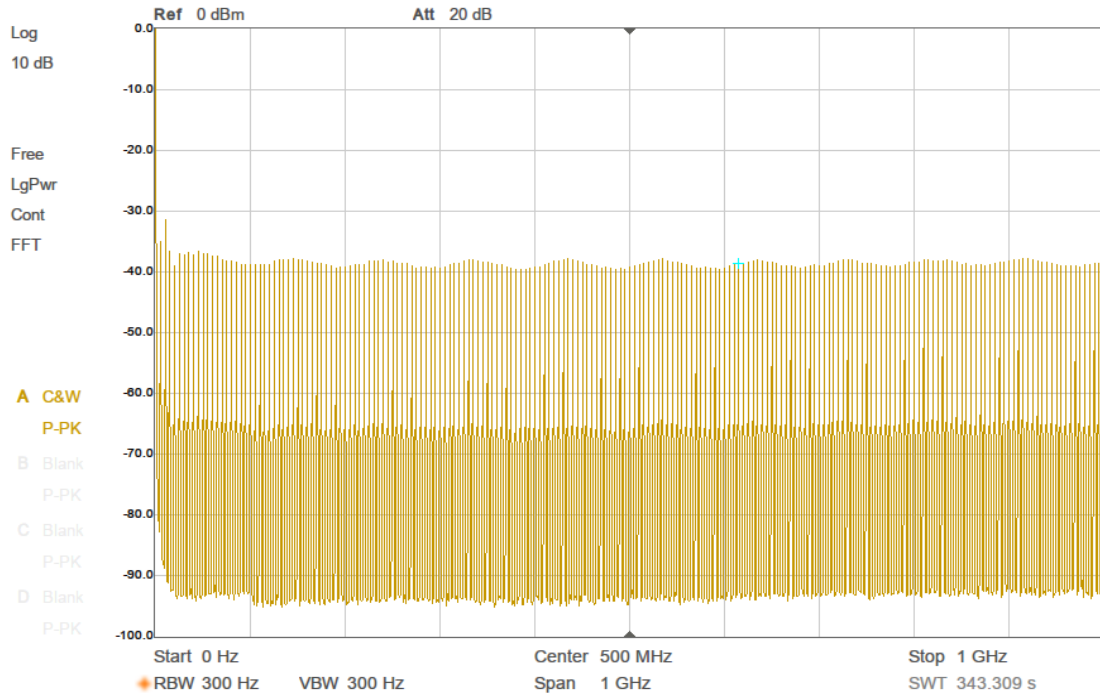


Picture 3: typ. comb spectrum, 0 – 1 GHz, 10 MHz base frequency

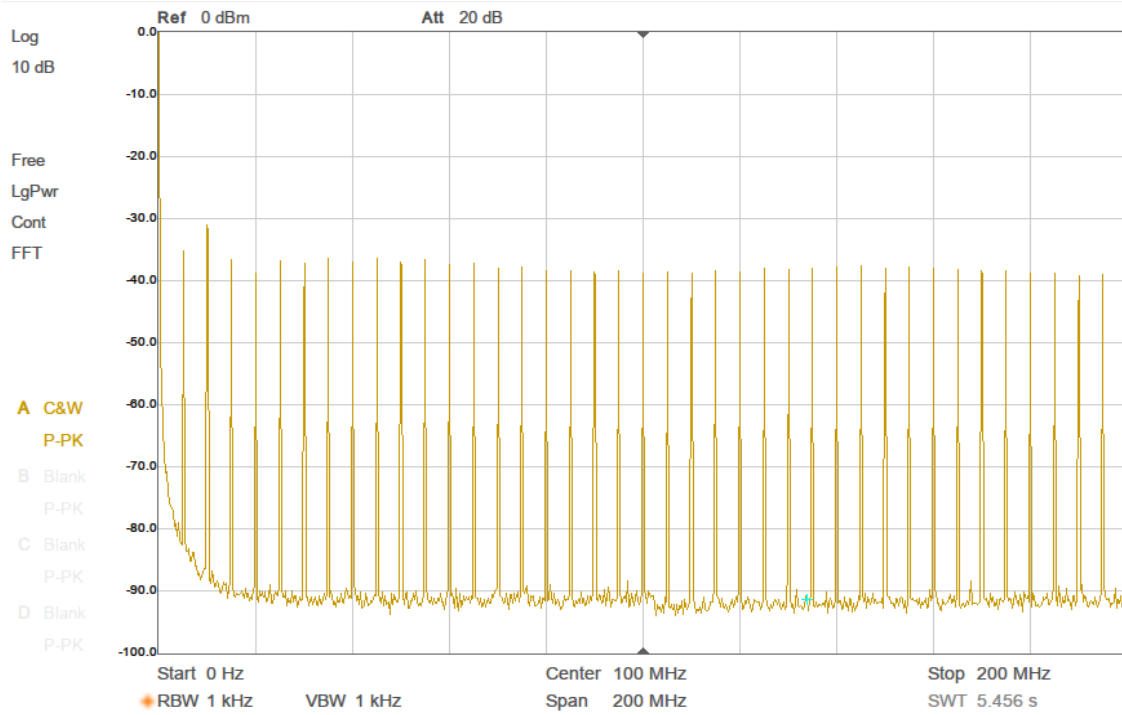


Picture 4: typ. comb spectrum, 0 – 200 MHz, 10 MHz base frequency

GENERAL PURPOSE COMB GENERATOR

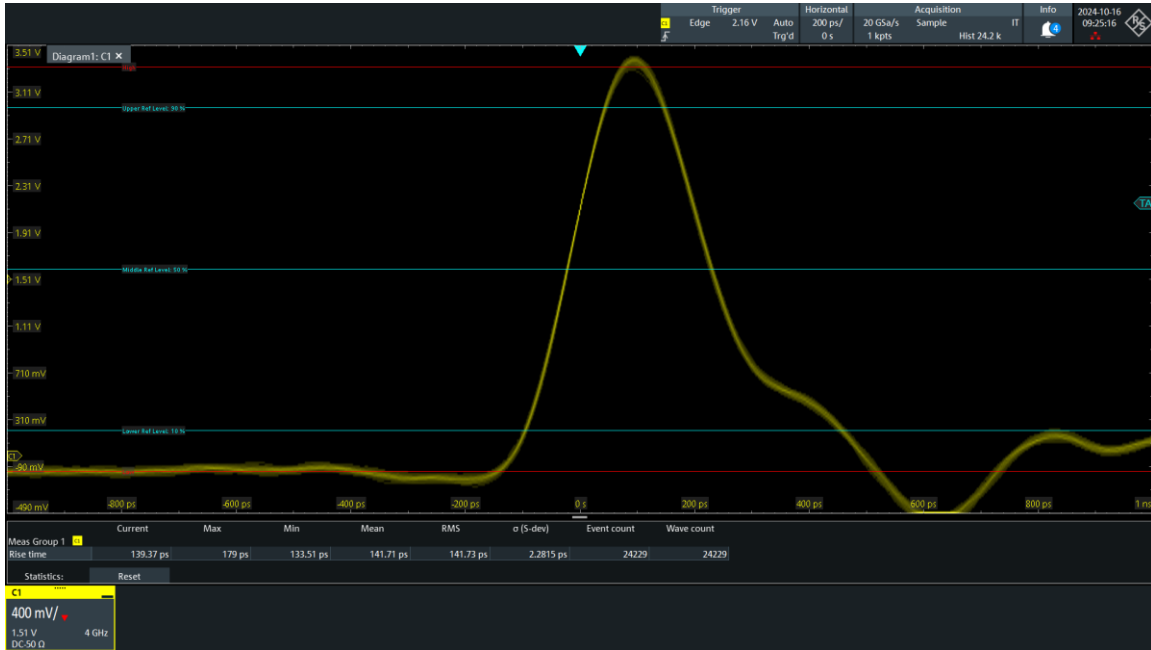


Picture 5: typ. comb spectrum, 0 – 1 GHz, 5 MHz base frequency



Picture 6: typ. comb spectrum, 0 – 200 MHz, 5 MHz base frequency

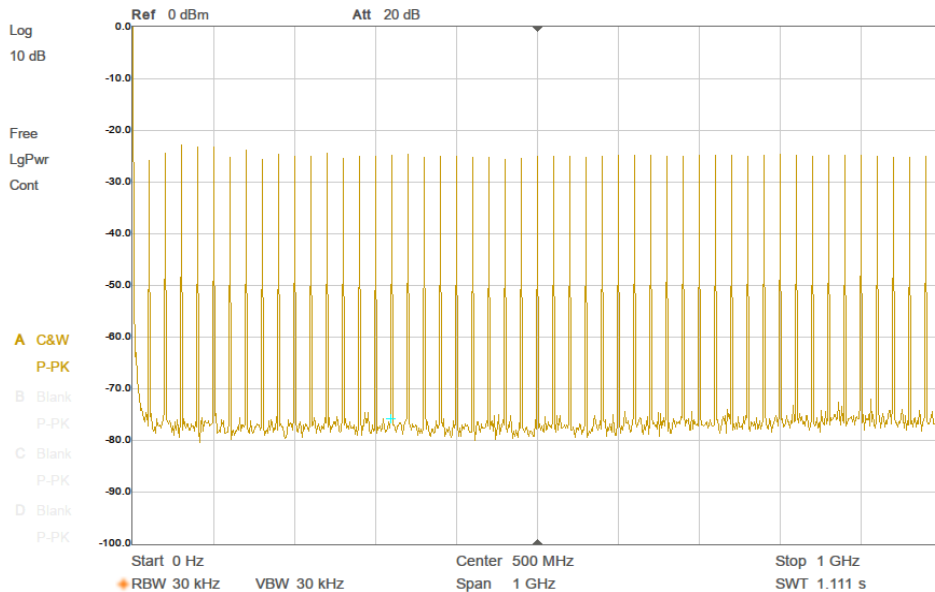
GENERAL PURPOSE COMB GENERATOR



Picture 7: output pulse, 20 MHz base frequency, 50Ω termination

4 Spectrum flatness

To improve spectral amplitude flatness, add a 6 dB or 10 dB attenuator to the RF output of the comb generator.



Picture 8: comb spectrum, 0 – 1 GHz, 20 MHz base frequency, 6 dB attenuator at RF output

GENERAL PURPOSE COMB GENERATOR

5 Ordering Information

Part Number	Description
TBCG4	General purpose comb generator USB-A to USB-C cable

6 History

Version	Date	Author	Changes
V 1.0	10.08.2024	Mayerhofer	Creation of the document
V 1.1	22.10.2024	Mayerhofer	Updated pulse rise time